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UNITED STATES DEPARTMENT OF AGRICULTURE  
BUREAU OF HOME ECONOMICS  
WASHINGTON, D.C.

NUTRITIVE VALUE OF SOYBEAN AND SOYBEAN PRODUCTS

The soybean, which has been utilized for many centuries in the orient, has recently gained favor in this country as an article of human food. It deserves wider recognition, since it is a good source of the minerals calcium, phosphorus, and iron, has a high content of protein of good quality, and in the dry soybean especially, a high content of easily digestible fat. It is a good source of vitamin B, a fair source of vitamin G, and contains some vitamin A.

Analyses show that only part of the carbohydrate in the soybean is in a form which is generally thought to be utilized by the body. About 8 per cent of the dried soybeans, and about 5 per cent of the fresh soybeans is in this form. The low content of "available" carbohydrate makes the soybean an especially desirable food for diabetics.

Data on the proximate composition and fuel value of fresh and dry soybeans and a number of soybean products are given here in Table 1. Data for the minerals calcium, phosphorus, and iron, are given in Table 11.

The light colored varieties of soybeans, either yellow or green, are usually preferred as human food. For use as a green vegetable the Haute variety is very satisfactory since it softens readily in cooking. Other varieties may be used but they require longer cooking. The Mammoth Yellow soybean is probably the most widely grown and it has been found desirable for table use.

Soybean flour may be prepared from the whole beans, or from the press cake remaining after the oil has been removed from the beans, the latter product being much lower in fat content. Soybean flours are usually lower in fiber than the whole bean meal, because of the removal of some of the coarse fibrous hulls by the process of sifting.

Information on the utilization of soybeans for human food, and on culture and varieties of soybeans, is to be found in Farmers' Bulletins 1617 and 1520, respectively.

JUN 9 1945

COMPOSITION AND FUEL VALUE OF SOYBEANS AND SOYBEAN PRODUCTS. - TABLE 1.

	Water	Protein (N x 5.71)	Fat	Total Carbohydrate by difference	Fiber	Ash	Calories Per 100 grams	Calories Per pound
	%	%	%	%	%	%		
Soybeans, green shelled 1/	64.7	12.4	6.3	14.4/	2.2	2.2	163.9	745
Soybean sprouts 1/	82.3	7.8	1.8	7.0	.9	1.07	75.4	340
Soybeans, dry whole seed or whole ground meal 2/	-	-	-	-	-	-	-	-
Soybean flour (sifted; from the whole bean 2/ From the press cake 3/	8.0	36.7	18.2	31.75/	5.1	5.37	437.4	1985
Soybean curd or cheese, fresh 2/	6.7	38.3	19.3	31.15/	2.9	4.55	451.3	2045
Soybean milk 2/	6.1	43.2	4.5	40.0	2.0	6.20	373.3	1695
Soy sauce 2/	83.6	8.6	4.5	2.3	.2	.96	84.1	380
	94.2	2.6	1.4	1.4	----	.376/	28.6	130
	65.2	6.1	1.2	8.5	----	19.0 7/	69.2	315

MINERALS IN SOYBEANS - TABLE 11.

	Water	Calcium	Phosphorus	Iron
	%	%	%	%
Soybean, green shelled 2/	64.7	0.0789	0.2225	0.0030
Soybean, dried 2/	8.0	.2057	.580	.0078

- 1/ From U. S. Dept. Agr. Circ. 146
- 2/ From unpublished averages on file in Bureau of Home Economics.
- 3/ From Piper and Morse, U. S. Dept. Agr. Bul. 439, (1916). p. 12.
- 4/ Available carbohydrate is approximately only 5%.
- 5/ Available carbohydrate is approximately only 8%
- 6/ The calcium and phosphorus in soybean milk are much lower than in cow's milk
- 7/ Consists of salt 17.6% and salt free ash 1.94%



Unedited Bureau of Home Economics Recipe for Yeast Breads made With Soybean Flour.--

Whole Wheat Bread with Soybean Flour

$2\frac{1}{2}$  cups milk

1 cake compressed yeast

4 tablespoons sugar

3 teaspoon salt

3 tablespoons fat

$5\frac{1}{2}$  cups whole wheat flour

3 cups soybean flour

Sift the soybean flour with the whole wheat flour and proceed as for white bread.

This recipe makes 3 pounds of bread.

The method is the same as for making ordinary whole wheat bread.

UNEDITED BUREAU OF HOME ECONOMICS RECIPE FOR YEAST BREADS MADE WITH SOYBEAN FLOUR.--

White Bread Made With Soybean Flour

2-3/4 cups milk

2 cakes compressed yeast

4 tablespoons sugar

4 teaspoons salt

2 tablespoons fat

8 $\frac{1}{2}$  cups flour

4 $\frac{1}{2}$  cups sifted soybean flour

Sift the soybean flour with the white flour and proceed as for white bread.

This recipe makes 4-1/3 pounds of bread.

The method is the same as for making ordinary white bread.

Food Research Laboratories, Inc.,  
114 East thirty-second Street  
New York

REPORT

Submitted to-

Date May 13, 1931

Laboratory No. 22390

Soyex Company, Inc.,  
60 John Street  
New York City.

Sample received May 5, 1931

Sample received May 5, 1931

Material-Soyex

Marking - Soyex, Soyex Company, Inc., 60 John Street, New York City.

Description- Flour made from whole Soya Beans.  
Pale yellow in color.

RESULTS IN EXAMINATION

Moisture	7.27 %
Protein	37.29 %
Fat	22.39 %
Carbohydrates	26.45 %
Fibre	2.15 %
Ash	4.45 %
	<hr/> 100.00 %
Starch	Trace only
Total phosphorus	1.20 %
Calorific Value per gram	4.70 %

Food Research Laboratories, Inc.

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Philip B. Hawk, President

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